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ABSTRACT

Developed as part of a 90-hour high school course in ornamental horticulture, this 50-minute lesson plan is designed to explain the process of pollination and fertilization of flowering plants. The lesson plan begins with information on the course for which the lesson was designed; equipment and audio-visual aids needed; required student materials; course objectives; bibliographic references; and special remarks for the instructor. Next, a step-by-step outline of the instructor's presentation is provided in a format indicating the length of time and the equipment or other aids needed for each step of the lesson. The lecture portion of the presentation includes a discussion of facts about simple sexual reproduction of flowering plants; types of flowers and plants that reproduce sexually; and the 13 parts of a flower; while the practicum portion of the lesson involves the dissection and examination of a hibiscus flower. The lesson plan includes handouts. (EJV)

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AN INTRODUCTION TO THE SEXUAL REPRODUCTION OF FLOWERING PLANTS

Ornamental Horticulture I,
Lesson Plan No. 5

Keith Ideoka

Western Curriculum Coordination Center
University of Hawaii, Manoa

JC 870 316

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LESSON PLAN

LESSON PLAN NO.	NAME:	PAGE
No. 5	Lahainaluna High School	PAGE 1 OF 36 PAGES

COURSE OF INSTRUCTION AND COURSE NUMBER:	TOTAL HOURS:	LESSON TITLE:
Ornamental Horticulture I VA 10	90 hrs.	An Introduction to the Sexual Reproduction of Flowering Plants

DAY AND DATE OF INSTRUCTION:	HOURS	PLACE:
Wednesday, November 26, 1986	50 min.	Wist Hall rm. 112

NO. OF STUDENTS:	REHEARSAL:	INSTRUCTOR AND ASSISTANTS:	STUDENT MATERIAL AND DRESS:
25		Keith Ideoka - Primary Instructor TBA - Assistant Instructor	pen or pencil notebook

REFERENCES:

-see attached page.

EQUIPMENT AND AUDIO-VISUAL AIDS:

-see attached page.

OBJECTIVES:

1.) Define Sexual Reproduction of flowering plants.
2.) Define the terms Pollination and Fertilization.
3.) Describe the process of pollination and fertilization of flowering plants.
4.) List the 7 methods in which flowering plants are pollinated.
5.) Correctly identify and label the 13 parts of a complete hibiscus flower.
6.) Explain the function of each of the 13 parts of a complete flower.

SPECIAL REMARKS:

-see attached page.

BIBLIOGRAPHY:

1. Janick, Jules, Horticulture Science, 3rd edition, Witt-Freeman and Co. San Francisco, 1963, pp. 84-88.

2. Purseglove, J.W., Tropical Crops-Dicotyledons, Longman Group Ltd., 1968,pp. 45-51.

3. Richardson, William B. and Moore, Gary E., Working in Horticulture, Gregg Division McGraw-Hill Book Co., New York, 1980, pp. 63-64 and pp. 112-113.

4. Soucie, Edward A., Tropical Horticulture for Secondary Schools, Book 1 , 2nd edition, PATS Educational Foundation, Micronesia, 1975, pp. 103-115.

5. No author, Curriculum Manual for Horticulture I, pp. HO-B3-U-1 to HO-B3-U-10.

EQUIPMENT AND AUDIO-VISUAL AIDS:

1.) 25 Common red, pink, or white hibiscus flowers
2.) 1 Overhead projector
3.) Chalkboard
4.) White chalk
5.) 2 Colored transparency pointers
6.) 3 Transparency pens
7.) 1 Projector screen
8.) 10 Razor blades
9.) 10 Cutting boards
10.) 1 roll paper towels
11.) Various sample flowers: Singapore Orchid, Red Jatropha, Bougainvillea, Pink double hibiscus, and Red poinciana.
12.) Handouts: Lesson Outline pages 1,2, and 3, Lab Practicum pages 4,5,and 6.
13.) Transparencies: 1) Sexual Reproduction of Flowering Plants: definition, 2) Pollination: defintion and 7 major methods, 3) Wind and Insect Pollination, 4) Fertilization: definition , 5) Hybrids: definition and 3 main benefits, 6) Papaya: Pistillate, Staminate, and Hermaphrodite, 7) Monoecious plant:squash, 8) Dioecious plant: papaya, 9) Complete Hibiscus with 13 parts.
14.) 1 Large plastic bucket
15.) 10 Sheets of white paper

SPECIAL REMARKS:

1.) Arrive early to class to arrange seats and overhead projector.

2.) Collect hibiscus flowers and purchase sample flowers one day in advance and place the flowers in a bucket for next day's lesson.

3.) Use revelation method to describe terms and concepts on overhead projector.

4.) Pass out handouts and materials for lesson before lesson begins.

5.) Write title of lesson, grade level, and descriptions of previous and future lessons on chalkboard before class begins.

6.) Have assistant instructor pass out razor blades at the beginning of Lab practicum.

7.) Stress safety precautions of handling razor blades before initiation of Lab practicum.

LESSON PLAN NO. _____

PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
I. INTRODUCTION		
A. PURPOSE AND OBJECTIVES Yesterday all of you learned about the process of Asexual reproduction of plants or how plants are reproduced vegetatively without the use of seeds. You also practiced grafting and air layering on common Hibiscuses with your teacher's aid during yesterday's lab session. Today, I will talk about Sexual reproduction of flowering plants or how plants are reproduced with the use of seeds. I will also give you some information on the objectives that are listed on your handout and on the chalkboard, so that by the end of this lesson you will be able to accomplish each of them.	5 min.	- Lecture
B. REASONS 1.) First of all, the information contained in this lesson is important to you because it will give you a better understanding of how higher organisms obtain their fruits and vegetables. In other words, it is important for us to know that almost all the plants that we consume were once flowers or seeds which are both products of Sexual reproduction.		- Lecture
2.) The information that I will give you in thes lesson will also help you increase your knowledge of Crop production and how you can increase your crop yields as a future farmer or home gardener.		

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
3.) Finally, it is important that you have this knowledge if you are to pursue further study in the field of Horticulture or Floriculture.. It is also required that all of you have this basic knowledge if you plan to work in any nursery-related business.		
C. PROCEDURE		
This class will divided into two major parts; (1) a lecture, and (2) a practicum. And for each of the two major parts of this lesson, each of you should be ready to take notes on the important facts described in the lesson. Also, because all of you have a handout on your desk, it is your responsibility to write down your notes in the blank spaces that are provided in your handout.		- Tell students to refer to their handouts and the chalkboard for the objectives. - Lecture
For the lecture part of this lesson, there will be a discussion on three important topics: 1) Important facts on simple sexual reproduction of flowering plant. 2) Types of flowers and plants that are involved in sexual plant reproduction. 3) The 13 parts of a complete flower.		

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
After we're finished with the lecture part of this lesson, we will begin our lab practicum in which each of you will have an opportunity to examine and dissect a Hibiscus flower. To help you complete your lab practicum, a Lab worksheet is provided for you on pages 5 and 6 of your handouts. Also, your Lab worksheet should be self-explanatory and again, there are more blank spaces provided on it for you to write down your answers based on your observations of a Hibiscus flower.		
II. EXPLANATION AND DEMONSTRATION	(45 min.)	
A. SEXUAL REPRODUCTION OF FLOWERING PLANTS		
Q. What is Sexual Reproduction of flowering plant?	3 min.	
A. Def. It is the process of reproducing plants by means of planting seeds. It involves the union of a male sex cell(sperm or pollen) and a female sex cell(egg or ovule) which ultimately results in the formation of a seed bearing the physical and physiological characteristics of both parent sex cells.		- Turn on Overhead Projector - Show transparency # 1 "Sexual reproduction:definition" - Recite definition
Three important concepts of sexual reproduction of flowering plants:		- Lecture
So far I have described to you what is Sexual reproduction of flowering plant, do any of you know about the processes that are involved in Sexual reproduction of flowering plants? Basically, the processes are very much like what happens in the birth process of mammals and many other living organisms, and there are three important concepts involved in the sexual reproduction process of plants that you should know, these are: 1)Pollination, 2)Fertilization, and 3)Hybrids.		

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PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
1.) Concept of Pollination Pollination- def. the transfer of male pollen or sperm cells onto the female portion of the flower. 7 major methods in which flowering plants are pollinated: a.) Man- by mechanical means using a Q-tip cotton swab and transferring the male pollen grains from the male part of a flower onto the female part of a flower. b.) Wind- strong or light winds can blow pollen grains from one plant to another for very long distances, such as when it is blown over vast oceans or continents. Pollen can also be blown over very short distances such as in the corn plant. c.) Insects- honeybees, butterflies, wasps, flies, and beetles which are also known as "pollinators" can carry pollen on their body parts as they fly and land from one plant to another. For example, honeybees have special structures on their hind legs to gather and hold pollen as they fly back to their hives, where they will use the pollen that they gathered to make bee's wax. d.) Birds- hummingbirds, honeycreepers, finches, and other nectar-feeding birds are also very efficient pollinators of flowering plants. They usually have specialized beaks to obtain the nectar and they mainly carry the pollen on their heads.	5 min.	- Show transparency # 2 "Pollination: definition and 7 major methods" - Discussion - Write in the 7 major methods of pollination on transparency and explain each method. - Remove transparency #2 - Show transparency # 3 "Wind and Insect pollination" and explain. - flip overlay on bottom and explain. - Turn off Overhead projector - Lecture

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PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
e.) Animals- this method involves the transfer of pollen from plant to plant by means of animals such as dogs, cats, sheep, horses, and cattle. These animals pick up pollen on their furs when they brush against low-growing plants and shrubs and carry the pollen to other plants in the area as they move about.		
f.) Water- this method occurs in the ocean, where aquatic plants such as kelp or seaweed is pollinated by means of flowing water which carries the pollen from plant to plant underwater.		
g.) Gravity- this method occurs when pollen grains respond to the earth's natural force of gravity and drops to the lower portions of certain plants. For example, the corn plant is a good example of this particular method because it has evolved through time to pollinate itself primarily by means of gravity; as you can see in this transparency.		- Turn ON Overhead projector - Show transparency #3 again and explain -Remove transparency #3
Subsummary:	2 min.	- Turn OFF Overhead projector
Define Pollination- the transfer of male pollen or sperm cells onto the female portion of a flower.		- Turn ON Overhead projector - Show transparency #2
Re-state the 7 methods of Pollination- a.) Man b.) Wind c.) Insects d.) Birds e.) Animals f.) water g.) Gravity		- Remove transparency #2

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
2.) CONCEPT OF FERTILIZATION Fertilization- def. the result of pollination when the male pollen or sex cells unites or comes in contact with the female eggs or ovules. Description of the Fertilization process: a.) male pollen from the male part of the plant lands onto or is transferred to the female part of a flower.(pollination) b.) pollen germinates like a seed, forms a pollen tube, and travels down a hollow structure. c.) eventually, the pollen tube reaches the female eggs after 1 to 24 hours. d.) male and female sex cells unite and fertilization occurs. Q. What do you think happens after pollination and fertilization has taken place? A. There will be the formation of seeds and eventually those seeds will ultimately turn into fruits. Note: Only the eggs that have been fertilized will form into live or 'viable' seeds. Viable seeds are those that have the potential to sprout and grow normally into mature plants.. Unfortunately, less than 50% of the eggs formed will be fertilized and become viable seeds.	3 min.	- Show transparency # 4 " Complete Hibiscus with pollen tube" - Use pointer and point at Stigma. - Use transparency pen and draw an arrow from stigma to ovary while explaining process. - Remove transparency #4 - Turn OFF Overhead projector - Ask question - pause - call on student - respond to answer - discuss

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PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
3.) CONCEPT OF HYBRIDS Hybrids- def. are plants that posess the physical and physiological characteristics of two or more different parent plants. Usually they are a result of cross-pollination or genetic engineering of plant cells. <u>Benefits:</u> 1.) Looks better, usually have better quality color, size, shape, and scent. ex. Hybrid tea roses, carnations, heleconias, gingers, and proteas. 2.) Higher production- a desirable characteristic for vegetable and flower production growers because higher production or yields will mean more profit for that particular crop. 3.) Resistance- resistance means better protection of your crop from various insect and disease pests or from environmental damage such as drought conditions, high salt content in soil, or low soil fertility. for ex.	2 min.	- Turn ON Overhead projector - Show transparency # 5 " Hybrids: definition and 3 main benefits" - Write down 3 main benefits on transparency and explain - Refer to charts and sample flowers - Turn OFF Overhead projector - Discussion

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
B. FIVE MAJOR CATEGORIES OF FLOWERS	3 min.	- Turn ON Overhead projector
1) Complete flower- a flower that has all 13 major parts on a single blossom.		- Show transparency #4 "Complete Hibiscus with pollen tube" and explain
2) Incomplete flower- a flower that lacks one or more of the 13 major parts of a complete flower.		- Remove transparency #4
3) Pistillate flower- a flower that has only female sexual parts on a single blossom. Also called a female flower.		- Show transparency #6 "Papaya: Pistillate, Staminate, and Hermaphrodite flower" and explain
4) Staminate flower- a flower that has only male sexual part on a single blossom. Also called a male flower.		
Q. Now that you know what a Pistillate and a Staminate flower is, does anyone know what a Hermaphrodite flower is?		- Ask rhetorical question
A. see below		
5) Hermaphrodite flower- a flower that has both male and female sexual parts on a single blossom. Also called a Bisexual flower.		- Flip overlay on bottom and explain
ex. papayas, mangoes, guavas, oranges, peppers, carnations, roses, daisies, etc.		- Remove transparency #6
		- Turn OFF Overhead projector

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
C. TWO MAIN "SEXUAL" CLASSIFICATIONS OF FLOWERING PLANTS:	2 min.	- Turn ON Overhead projector
1.) Monoecious- a plant that has both male and female flowers on the <u>same</u> plant. ex. curcubits,		- Show transparency # 7 "Monoecious plant: Squash"
2.) Dioecious- a plant that both male and female flowers on <u>separate</u> plants. ex. papaya, date palm, spinach, strawberries, and asparagus	-	- Show transparency # 8 "Dioecious plant: Papaya" and explain - Turn OFF Overhead projector
D. 13 PARTS OF A SIMPLE COMPLETE FLOWER:	10 min.	- Lecture
1.) Receptacle- the swollen portion of a flower that is located just above the flower stalk. This part will eventually become the fleshy edible part of certain fruits. ex. apples, pears, and guavas.		- Turn ON Overhead projector - Show transparency # 9 "Complete Hibiscus with 13 parts"
2.) Sepal- green leaf-like structures located just above the receptacle, functions to make food for the plant through the process of photosynthesis.		- Write in terms on blank speces on transparency and describe each part.
3.) Petal- colorful, usually sweet-scented leaf-like structures located right above the sepals. They fuction to attract insects and birds, also to protect the sexual parts of a flower.		- Lecture

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
4.) Calyx- collectively, all the sepals of a flower. 5.) Corolla- collectively, all the petals of a flower. 6.) Perianth- collectively, all the sepals and petals together on a flower. 7.) Ovary- the part of a flower that usually is enlarged, contains seeds, and will eventually become a fruit. 8.) Style- the long tube-like structure located right above the the ovary, it serves as a passageway for pollen to travel down to the ovary. It is also where the pollen tube begins to elongate and grow. 9.) Stigma- the area of pollination located at the very top of the style, it is usually very sticky in order to capture free-moving pollen in the environment. 10.) Pistil- the female part of a flower, consists of the stigma, style, and ovary. 11.) Filament- long or short thin structure located on the sides or below the stigma, it may originate from the top or bottom of the Pistil. It functions to support pollen grains. 12.) Anther- soft, cushiony structure, usually yellow to orange in color. It is the part that bears the pollen or male sex cells. 13.) Stamen- the male part of a flower, consists of the anther and filament.		- Lecture - Turn OFF Overhead projector

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III. SUMMARY	1 min.	
Closing statement- After today's lesson, I hope that the next time you go to the supermarket to purchase a fruit or vegetable, you'll know how it came about through Sexual reproduction. Also I hope that you'll begin to appreciate the beauty and importance of flowers as you see them while walking around our campus. Finally, if you have some spare time in the future, try visiting a botanical garden and see the many different types of flowers that we have in this world we live in.		

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
E. LAB PRACTICAL	14 min.	
Hopefully, by now all of you know what the 13 parts of a complete flower are and why they are important for Sexual reproduction of flowering plants, to check if you have a good grasp of this knowledge we'll now have our Lab practicum in which you'll dissect and examine a common Hibiscus flower and answer the questions provided for you on your handouts.		
As you can see, there are many different types of flowers that come in all colors, shapes, and sizes. Most of these flowers that you see on these two charts however are highly modified, very complex, and have more than the 13 basic parts of a flower. It would also be very interesting to study them, however because this is your first lesson on the identification of flower parts, we will use a simple common Hibiscus as a complete flower specimen for our Lab practicum. As I stated earlier in this lesson, your Lab practicum will be self-explanatory and you'll just have to follow the procedure on your handout to complete it.		- Refer to charts
Before you begin this excercise, take a short time to read the objectives and procedure, then you can start on your own. I will be around the class to help you or to answer any questions that you may have.		
*Begin Lab Practical Clarification of any questions and discussion.		- Walk around class and help students if needed

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
F.) REVIEW OF LECTURE: a.) 13 Parts of a Simple Complete Flower: Q. What are the 2 parts of the perianth? A. 1) sepal 2) petal Q. What 3 parts of a complete flower make up the pistil? A. 1) stigma 2) style 3) ovary Q. What part of a complete flower is usually sweet-scented and brightly colored? A. Petals Q. What is the function of the petals? A. To attract insects and birds, and also to protect the sexual parts of a flower. Q. Between what 2 parts of a complete flower is the style located? A. 1) stigma 2) ovary b.) Two Main "Sexual" Classifications of Flowering Plants: 1.) Monoecious- a plant that has both male and female flowers on the same plant. 2.) Dioecious- a plant that has both male and female flowers on separate plants.		- Review, if time permits - Tell students to refer to their handouts - Ask questions *Use basic questioning method 1) Ask question 2) Pause 3) Call on student 4) Respond to answer

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
c. Five Major Categories of Flowers: 1) Complete, 2) Incomplete, 3) Pistillate, 4) Staminate, and 5) Hermaphrodite. Q. Which one of the five major categories of flowers would be associated with the word "bisexual"? A. Hermaphrodite flower Q. Would a Staminate flower consist of only male or only female sexual parts? A. Male parts only. Q. Why is the Hibiscus flower called a Complete flower? A. Because it has all 13 parts on a single blossom. d. Sexual Reproduction of Flowering Plants: Q. What is the final product that results from Sexual reproduction of flowering plants? A. A seed that bears the physical and physiological characteristics of two parent sex cells.		

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
Q. What are the 3 Concepts of Sexual Reproduction ? A. 1) pollination 2) fertilization 3) hybrids. Q. What are the 7 methods in which flowers are pollinated? A. 1) Man 2) Wind 3) Insects 4) Birds 5) Animals 6) Water 7) Gravity. Q. Can anyone give me 3 benefits of Hybrid flowers? A. 1) better looks or appearance 2) higher production 3) resistance(to insects, diseases, and environmental damage)		

Name _____
Last First

Date _____

LESSON OUTLINE

AN INTRODUCTION TO THE SEXUAL REPRODUCTION OF FLOWERING PLANTS

I. INTRODUCTION

a. Objectives

1.) Define Sexual Reproduction of Flowering Plants.
2.) Define the terms Pollination and Fertilization.
3.) Describe the process of pollination and fertilisation of flowering plants.
4.) List the 7 methods in which flowering plants are pollinated.
5.) Correctly identify and label the 13 parts of a complete Hibiscus flower.
6.) Explain the function of each of the 13 parts of a complete Hibiscus flower.

b. Reasons

c. Procedure

II. EXPLANATION AND DEMONSTRATION

A. Sexual Reproduction of Flowering Plants.

definition-

Three Important Concepts of Sexual Reproduction of Plants:

1.) Pollination:

definition-

7 Major methods in which flowering plants are pollinated:

a.)

b.)

c.)

d.)

e.)

f.)

g.)

2.) Fertilization:

definition-

3.) Hybrids:

definition-

3 Major benefits of hybrid plants:

a.)

b.)

c.)

B. Five Major Categories of Flowers

a.) Complete flower-

b.) Incomplete flower-

c.) Pistillate flower-

d.) Staminate flower-

e.) Hermaphrodite flower-

C. Two Main Sexual Classifications of Flowering Plants

a.) Monoecious -

b.) Dioecious -

D. 13 Parts of a Simple Complete Flower

a.) Receptacle-

b.) Sepal-

c.) Petal-

d.) Calyx-

e.) Corolla-

f.) Perianth-

g.) Ovary-

h.) Style-

i.) Stigma-

j.) Pistil-

k.) Filament-

l.) Anther-

m.) Stamen-

E. LAB PRACTICUM (see pages 5, 6, and 7 of your handouts)

F. REVIEW

III. SUMMARY

Name _____

Date _____

LAB PRACTICUM WORKSHEET

AN INTRODUCTION TO THE SEXUAL REPRODUCTION OF FLOWERING PLANTS

I. INTRODUCTION

Title: Dissection of a Hibiscus flower and Identifying It's Parts

II. OBJECTIVE

-to identify each of the 13 parts of a complete Hibiscus flower.
-to distinguish between a male part of a flower from a female part of a flower.
-to recognize differences in physical morphology in various sample flowers.

III. MATERIALS

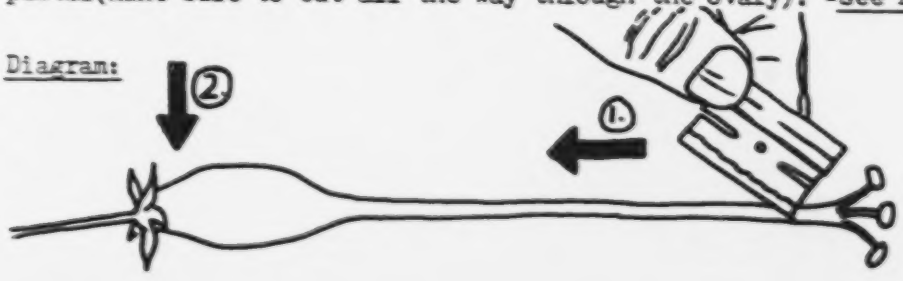
a. 1 common Hibiscus flower(pink, red, or white)
b. 1 single-edged razor blade
c. 1 cutting board
d. 1 sheet paper towel
e. 1 observation sheet
f. various other sample flowers: Singapore Orchid, Red Jatropha, Bougainvillea, Pink Double Hibiscus, and Red Poinciana.

* DEMONSTRATION by instructor

IV. PROCEDURE

1. Go to the front table and pick up a Hibiscus flower of any color from the plastic bucket.
2. Take the Hibiscus flower back to your desk and shake off any excess water onto your paper towel.
3. Place the Hibiscus flower onto your cutting board and examine it, see if you can recognize all of the 13 flower parts as described in the lecture.
4. Locate the sepals of your Hibiscus flower, cut them off with your razor blade, and place them on your observation sheet.
5. Do the same with the petals.
6. Locate the male part or stamens(anther and filament), cut each of them off, and place them on your observation sheet.
7. Locate the female part or pistil(stigma, style, and ovary),and make a longitudinal cut from the uppermost end of the pistil to the lower end of the pistil(make sure to cut all the way through the ovary). -<u>see Diagram.</u>

<u>Diagram:</u>



8. Examine the contents of the ovary and place pistil onto your observation sheet.
9. Return your razor blades to the front table when you are finished and answer the questions on the following page.

V. OBSERVATIONS AND RESULTS

Questions: (to answer the following questions, use your observation sheet)

1. How many stamens have you obtained from your dissected Hibiscus flower? _____

2. How many sepals have you obtained? _____

3. What is the color of the pollen grains on the anthers?

4. How many petals have you obtained? _____

5. What is the color of the style and stigma of your Hibiscus flower?

6. Briefly, describe the contents of the ovary in terms of color, size, and texture:

OBSERVATION SHEET

Sepals

Petals

Stamens

Pistil

Sexual Reproduction of Flowering Plants

Sexual Reproduction of flowering plants -

definition: the process of reproducing plants by means of planting seeds. It involves the union of a male sex cell (sperm or pollen) and a female sex cell (egg or ovule) which ultimately results in the formation of a seed bearing the physical and physiological characteristics of both parent sex cells.

Pollination

1.) Pollination – the transfer of male pollen or sex cells onto the female portion of a flower.

7 major methods in which Flowering plants are pollinated:

a)

b)

c)

d)

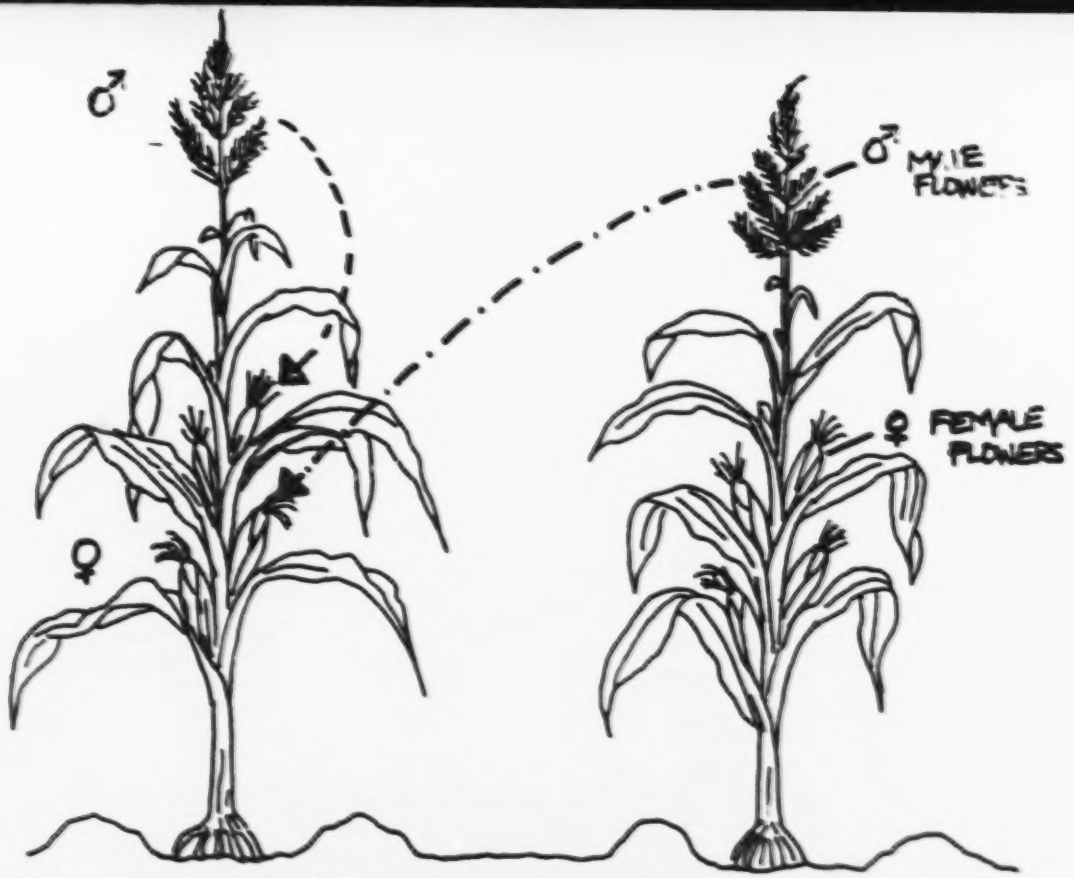
e)

f)

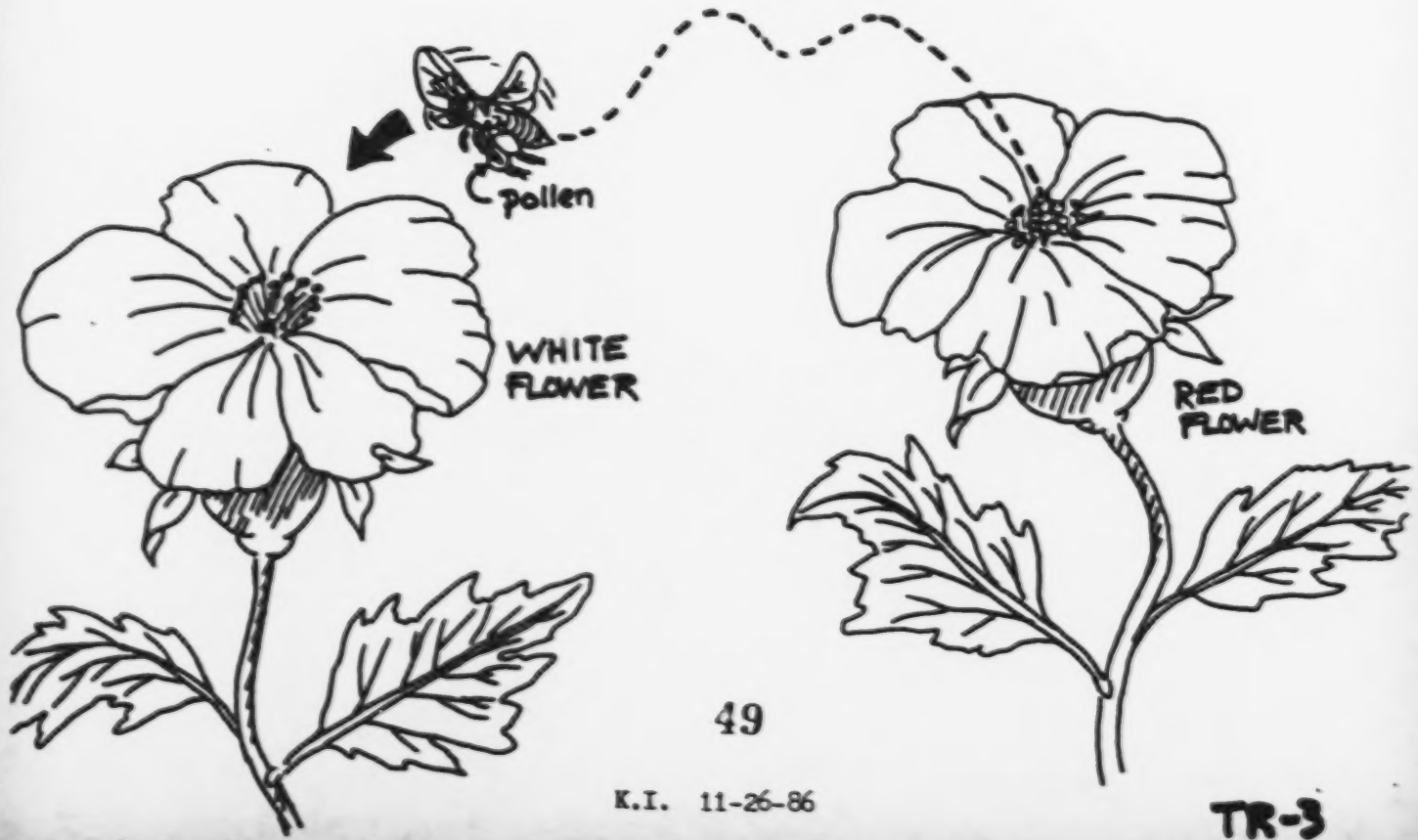
g)

K.I. 11-26-86

TR-2



CORN: MONDECIOUS PLANT



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TR-3

Fertilization

2) Fertilization - the result of pollination when the male pollen or sex cells unites or comes in contact with the female eggs or ovules.

K.I. 11-26-86

TR-4

Hybrids

3.) Hybrids - plants that possess the physical and physiological characteristics of two or more different parent plants.

3 major benefits of hybrid plants:

a)

b)

c)

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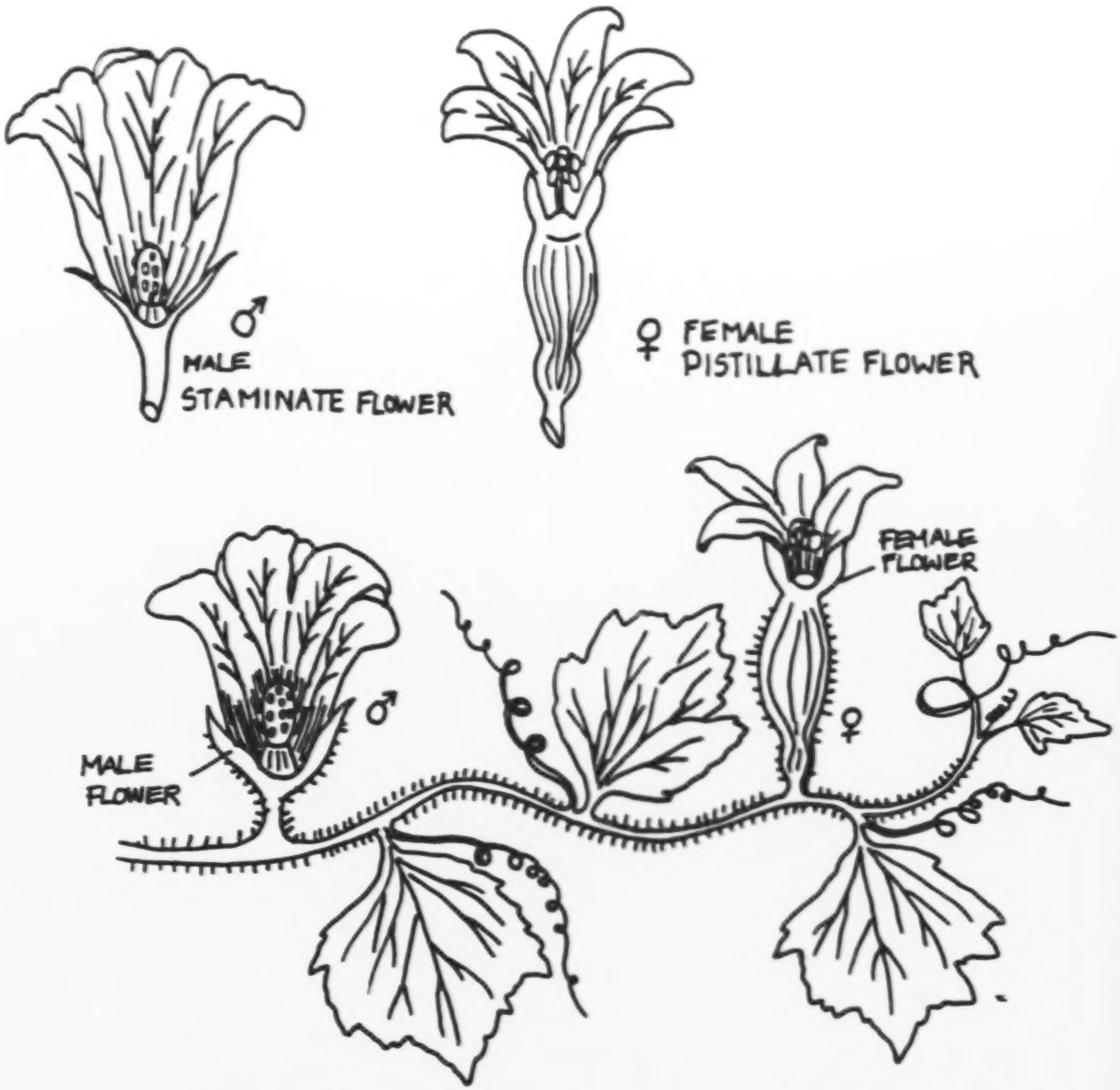

SQUASH: MONOECIOUS PLANT

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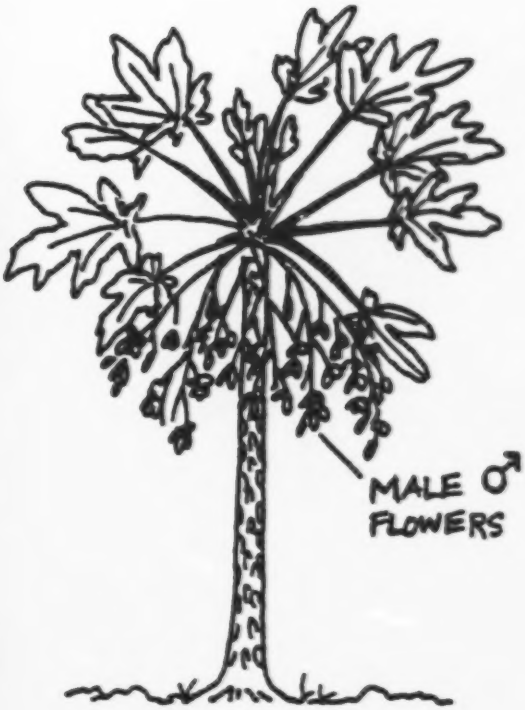
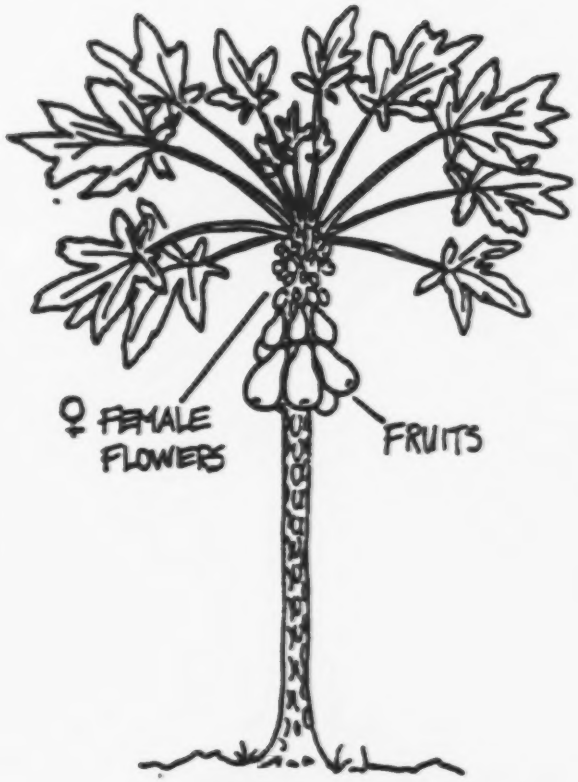
TR-6



MALE PAPAYA TREE



FEMALE PAPAYA TREE

DIOECIOUS PLANTS

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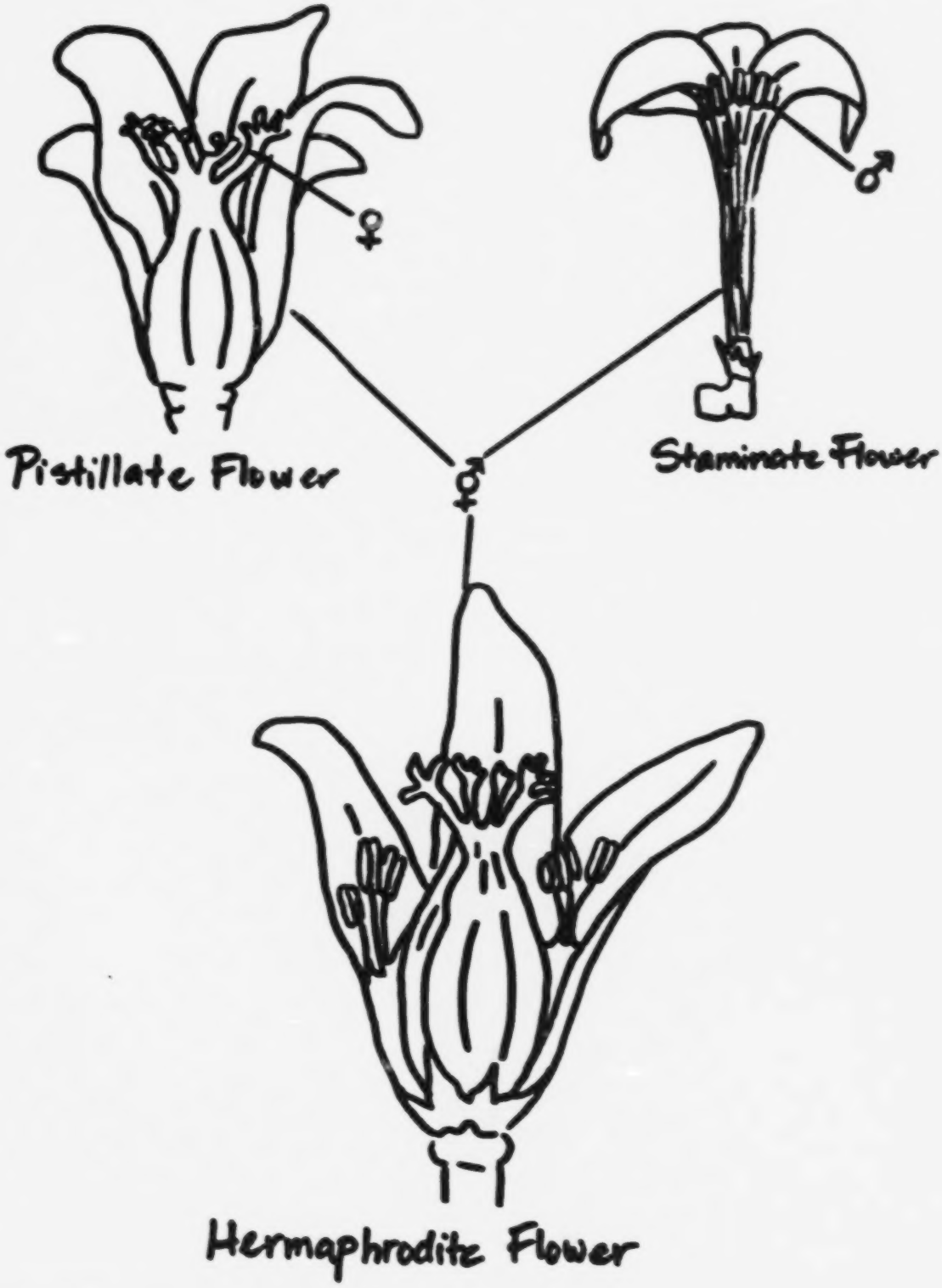

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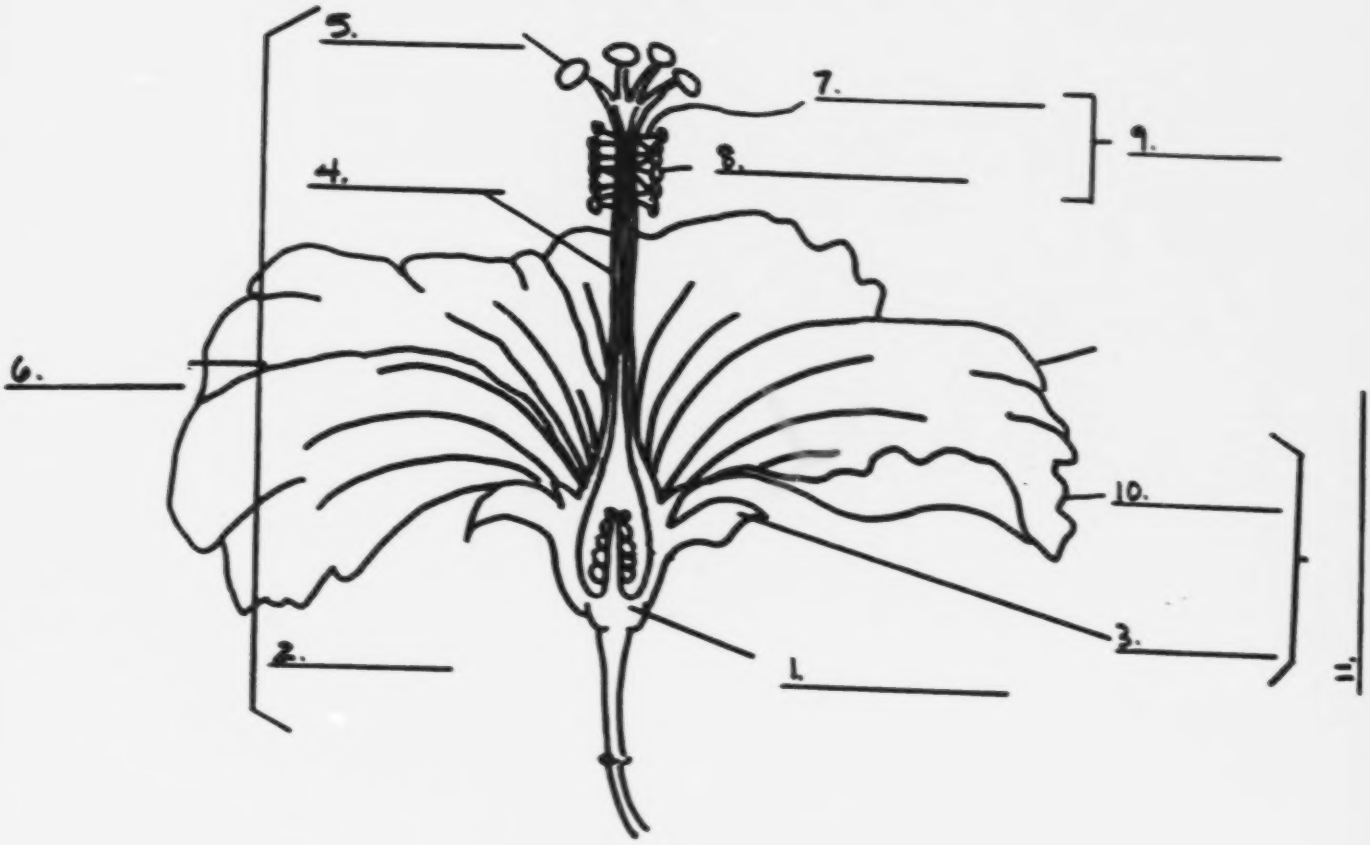
TR-8

LABEL each flower part:



12. _____ collectively, all the sepals together.

13. _____ collectively, all the petals together.

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